

NEURAL NETWORK FOR GENERATING AUV MISSIONS

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The article addresses the problem of automating the generation of mission programs for autonomous underwater vehicles (AUVs) using a neural network, working without Internet access. It examines the full cycle of fine-tuning a pre-trained large language model Llama 3.1 8B Instruct with the «transformer» architecture for generating mission programs in a specialized underwater research programming language (URPL), starting from dataset formation and ending with model inference. LORA and 4-bit quantization methods are presented and described for increasing the speed of language model training and reducing the requirements for devices used to run the trained model. The use of RAG files containing up-to-date information on language commands (syntax, semantics, mandatory and optional parameters), as well as relevant data for generating missions for specific water areas, is described. The result of the work was a neural network that demonstrated high accuracy in generating code in URPL based on queries in natural (Russian) language, as well as good resistance to noise in the input data.

Keywords: AUV, neural networks, mission, intelligent AUV-operator assistance system, AUV mission programming language, URPL.

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